Retinal Embolus: A Sign of Systemic Vascular Occlusive Disease

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Case History

A 62-year-old white male presented with a gray spot in his vision, increasing in size in the left eye. He denied painful vision loss, recent trauma, significant weight loss or fatigue, headache, flashes, or floaters. His pertinent medical history included hypertension, hyperlipidemia, stroke, and long-term smoking. His ocular history included longstanding history of visual disturbances, multiple Hollenhorst plaques, and a resultant small scotoma in the left eye, stable to 2014.

Pertinent Findings

	OD	OS
Visual Acuity	20/20	20/20 with preference for eccentric fixation
Confrontation Visual Field	FTFC	Nasal constriction
Optic Nerve Head	0.20R	0.20R with possible plaque at vessel exiting cup
Macula	Flat/even	Pinpoint Hollenhorst plaque SN to fovea
Posterior Pole	Clear	Plaque at first bifurcation of IT arcade
Vessels	Attenuated arteries with exaggerated ALR	

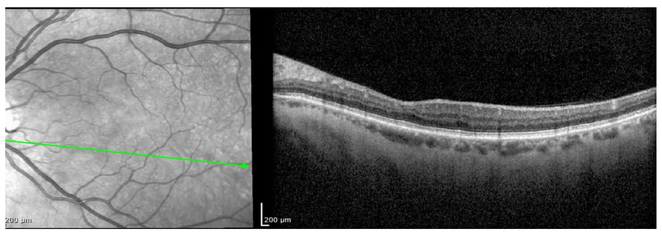

***Figure 1*: OCT-macula OS - localized area of retinal thinning inferior temporal to ONH**

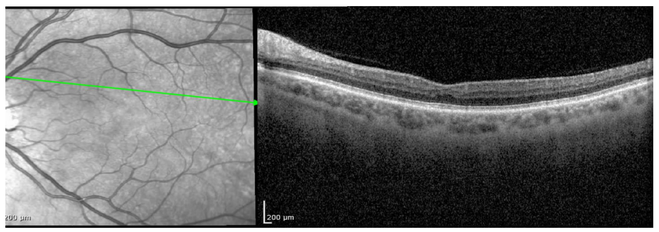

***Figure 2:* OCT-macula OS – localized area of inner retinal atrophy extending along superior nasal macula**

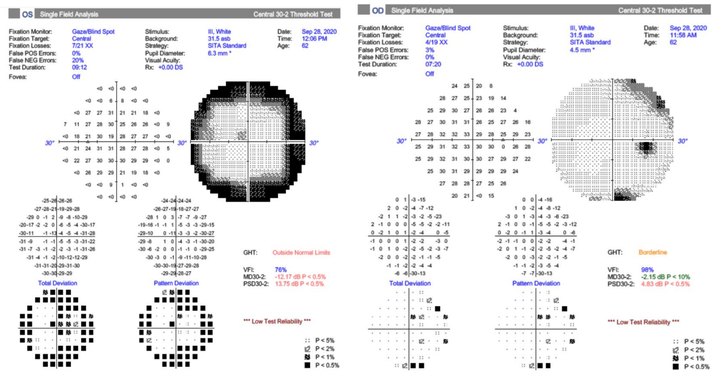

***Figure 3*: HVF 30-2**
OD: shallow superior and inferior temporal depressions, respecting the vertical midline
OS: generalized field contraction with shallow central scotoma

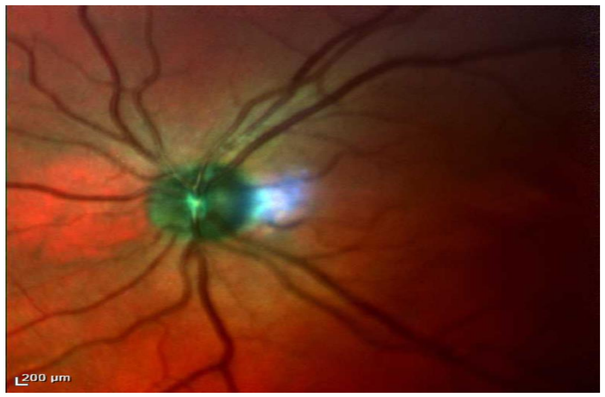

***Figure 4*: OCT Color Photo – possible plaque at vessel exiting ONH**

Differential Diagnoses

- **Branch retinal artery occlusion**
- **Posterior vitreous detachment**
- **Maculopathy (e.g. macular hole, choroidal neovascular membrane)**

Diagnosis

Fundus examination, OCT, HVF 30-2, and medical history coincided with a diagnosis of branch retinal artery occlusion in the left eye. Due to a possible plaque within the vessel exiting the ONH, there was also possibility of a pending central retinal artery occlusion in the left eye.

The patient denied signs and symptoms of stroke or giant cell arteritis/temporal arteritis. Symptoms, exam findings, and medical history strongly suggested concurrent systemic vascular occlusive disease.

Treatment and Management

The patient was referred to a retina specialist urgently for fluorescein angiography to rule out central retinal artery occlusion. Fluorescein angiography showed normal blood flow in the right eye and normal transit in the left eye with a confirmed Hollenhorst plaque within the inferior temporal arcade.

Due to increased risk for cerebrovascular and cardiovascular events, updated CT angiography of the head and neck were ordered, and the patient's primary care provider was alerted. The patient was then referred to a vascular surgeon who identified 80 percent irregular plaque in the left internal carotid artery and recommended carotid endarterectomy. The patient was also thoroughly counseled on the importance of smoking cessation by optometry, primary care, and vascular surgery.

The underlying causes and disease process of retinal artery occlusions (RAO) are similar to those of acute cerebral infarctions. Because of this relationship, the National Stroke Association and American Heart Associations have included "retinal cell death attributable to ischemia" in the definition for stroke. Studies have also shown that a cardioembolic source is evident on echocardiogram for a majority of individuals with RAO. Furthermore, 10 percent of RAO patients have a stroke or transient ischemic attack either before or after the onset of the occlusion and nearly 25 percent have a myocardial ischemic event either before or after the onset of occlusion.

Conclusion

Retinal artery occlusions signify a reduction in anterior cerebral and ocular perfusion. Understanding the systemic implications of retinal artery occlusions is crucial to appropriate management; patients who present with retinal artery occlusions often have coexisting systemic vascular disease and have an increase in cerebrovascular and cardiovascular morbidity and mortality. Thus, acute retinal arterial occlusive events must be co-managed with primary care and vascular specialists.

References

- **Hayreh, S. S. (2011). Acute retinal arterial occlusive disorders. *Progress in retinal and eye research*, *30*(5), 359-394.**
- **Hayreh, S. S., & Zimmerman, M. B. (2017). Ocular arterial occlusive disorders and carotid artery disease. Ophthalmology Retina, 1(1), 12-18.**
- **Biousse, V., Nahab, F., & Newman, N. J. (2018). Management of acute retinal ischemia: follow the guidelines! *Ophthalmology*, 125(10), 1597-1607.**